

WHAT IS CLAIMED IS:

1. A plasma processing method for forming, under a reduced pressure, a thin-film circuit on a processing-object substrate which is to be subjected to plasma processing, the method comprising:

before performing plasma processing on the processing-object substrate, subjecting the processing-object substrate to a charge-neutralization-use plasma in gas composed mainly of inert gas so that charges electrified on the processing-object substrate are neutralized.

2. The plasma processing method as claimed in Claim 1, wherein the inert gas is at least one gas selected from among Ar, He, N₂, H₂, and vaporized H₂O gas.

3. The plasma processing method as claimed in Claim 1 or 2, wherein top and bottom surfaces of the processing-object substrate are simultaneously subjected to the plasma in the inert gas.

4. A plasma processing apparatus comprising:

a vacuum vessel;

a first electrode for placing thereon a processing-object substrate which is to be subjected to plasma processing;

a lift pin for holding thereon the processing-object substrate and placing the substrate onto the first

electrode;

a conveyance system for transferring the processing-object substrate to the lift pin;

5 a second electrode disposed so as to confront the first electrode;

an evacuator for evacuating interior of the vacuum vessel;

a process-gas introducer for introducing process gas into the vacuum vessel;

10 a high-frequency power supply for, in a state that the process gas is introduced into the vacuum vessel by the process-gas introducer while the interior of the vacuum vessel is evacuated by the evacuator, applying a high-frequency power to the first electrode so that a
15 plasma is generated in the vacuum vessel;

an inert-gas introducer for introducing inert gas into the vacuum vessel before the processing-object substrate is subjected to plasma processing with the process gas introduced into the vacuum vessel by the
20 process-gas introducer; and

a control unit for, before execution of the plasma processing on the processing-object substrate, controlling the high-frequency power supply to generate an electrified charge-neutralization-use plasma in the inert
25 gas.

5. The plasma processing apparatus as claimed in Claim 4, wherein the control unit controls operation of the lift pin so that before the placement of the processing-object substrate onto the first electrode, top-and-bottom surfaces of the processing-object substrate are simultaneously subjected to the electrified charge-neutralization-use plasma by the inert gas.